REMARKS

No new matter is added by any of the amendments to the claims. Written support for the amendments to the claims can be found in the specification and drawings.

Claim Objections

The Examiner had objected to Claims 24, 25, and 27 as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. Claim 24 has been cancelled and Claim 25 is amended to depend from Claim 23. Claim 27 has been amended to insert features of the pump head set forth in Claim 10. In view of the amendments to Claims 24, 25, and 27, it is believed that the objections set forth in the Official Action are overcome.

35 USC § 112, Second Paragraph

The Examiner rejected Claim 17 under 35 USC 112, second paragraph as being indefinite on the basis that it was not clear which gear was being referred to in the claim. The Applicant submits that Claim 17 is not indefinite because the Examiner's interpretation of the claim is unreasonable. More specifically, Claim 17 as filed recites that "the gear teeth of the rotor are elongate and longer than the teeth of the gear." Since the gear teeth of the rotor cannot be longer than themselves, the reference to "the teeth of the gear" can be reasonably interpreted to refer only to the teeth of the transmission mechanism gear. Nevertheless, in order to remove any doubt Claim 17 has been amended to recite "...the gear teeth of the rotor are elongate and longer than the teeth of the gear of the transmission mechanism". Claim 40 has been amended similarly.

35 USC § 102(b): Claims 28-32 and 41-44

The Examiner rejected claims 28 to 32 and 41 to 44 under 35 USC 102(b) as anticipated by US 3,674,383 (Iles). Iles teaches three embodiments of a peristaltic pump. The first embodiment is shown in Figures 1 to 4, the second embodiment is shown in Figure 5, and the third embodiment is shown in Figure 6.

In the first embodiment, the pump has a motor 13 that drives a disc 15. A frustoconical roller 17 is mounted on the disc. The pump has a tube holder 11 that has two block parts 19 and 20. A single tube inlet 23 is provided in one of the pump block parts 20, and a single tube outlet 25 is positioned in the other pump block part 19. To insert the tube into the holder 11, the two pump housing parts 19, 20 must be separated. The tube is inserted through the single tube inlet, around the recess in the first pump block part and the second pump block part, and out through the single tube outlet. The tube holder parts are then connected back together. Operation of the motor causes the disc to travel around from the single tube inlet to the single tube outlet.

The second embodiment differs in that it has an angled cylindrical roller as the rotor, rather than a frustoconical rotor. Additionally, a separate strap 31 is provided to hold the tube in position. The embodiment of Figure 6 differs in that it has a tube positioner 33 integrated into the tube. The tube holder of Iles only has a single tube inlet and a single tube outlet. Therefore, it is not possible for the tube in the Iles configuration to extend outside of the tube housing as claimed in original Claim 28. Notwithstanding those distinctions, Claim 28 has been amended to specifically recite the tube race configuration of the present invention.

As now set forth in Claim 28, the tube race has a first race part around one part of the recess and a second race part around another part of the recess, a first tube inlet into the first race part and a first tube outlet from the first race part, a second tube inlet into the second race part and a second tube outlet from the second race part, the first race part extending between the first tube inlet and first tube outlet and comprising an occluding surface against which part of the tube can be compressed in use by a tapered pump rotor, the second race part extending between the second tube inlet and the second tube outlet and comprising an occluding surface against which part of the tube can be compressed in use by the (same) tapered pump rotor. With the claimed arrangement a tube can be inserted into the tube race so that it extends in through the first tube inlet, around the first race part, out through the first tube outlet, in through the second tube inlet, around the second race part, and out through the second tube outlet, such that the tube exits and reenters the tube race, and such that a portion of the tube between first tube outlet and second tube inlet is external of the tube race.

Those features of the Applicants' claimed peristaltic pump are clearly not taught or suggested by Iles. The Iles housing has only a single tube inlet and a single tube outlet. The Iles configuration does not enable the tube to exit and re-enter the tube race, with a portion of the tube external of the tube race as claimed. The Iles housing does not have two inlets and two outlets. While it may be possible for the tube holder of Iles to be used with another tube holder (lines 13-17 of column 4 of Iles), two rotors would be required, one per tube holder. Therefore, Iles does not have a single tube race with two tube race parts as claimed, with a first tube inlet, a first tube outlet, a second tube inlet, and a second tube outlet. It is noted that Claim 28 as amended refers to "a pump rotor" and "the pump rotor". That is, the portions of the tube extending around the first race part and second race part can be occluded by a single pump rotor in the tube holder of the present invention.

The Applicants have determined that by having a tube exit and re-enter tube race as claimed, the rotors only act against discrete parts of the tube, which minimizes longitudinal movement of the tube as the rotor rotates. Additionally, the tube inlets and outlets help retain the tube in a desired axial position during pumping. The applicants have also established that a satisfactory pumping action can be achieved when only discrete parts of the tube are acted on by the pump rotor. Such a configuration is not taught or suggested by Iles. In fact, Iles states in the specification that at least one complete convolution of flexible tubing must be provided in the block assembly, with "the only condition being that the roller must be in contact with such a coil along the whole length of at least one convolution" (lines 38 to 46 of column 3 of Iles). Therefore, Iles teaches away from the Applicants' claimed peristaltic pump as set forth in Claim 28 in which part of the tube between a first race part and a second race part is external of the tube race.

Claims 32 and 33 have been amended to provide correct antecedent basis in view of the amendments to Claim 28. Claims 29-44 depend from Claim 28 either directly or indirectly and thus, include all of the features set forth in Claim 28. Therefore, Claims 29-44 are allowable for at least the same reasons as Claim 28.

The Allowed Claims

The Examiner indicated that Claims 1 to 23, 25, and 26 are allowed. However, the Examiner's statement of reasons for allowance of those claims suggests that some clarification is needed relative to the subject matter of Claims 1 and 23. Therefore, Claims 1 and 23 have been amended to add features that more particularly point out and distinctly claim the subject matter of the Applicant's claimed invention. The features added by the amendments to Claims 1 and 23 are essentially the same features added by the amendment of Claim 28. Because the scope of Claim 1 and 23 is not broadened by the amendments thereto, Claims 1 and 23 remain in allowable condition.

CONCLUSION

In view of the foregoing amendments and remarks, it is believed that all of the pending claims are in condition for allowance. The Examiner is respectfully requested to reconsider the rejection of the application in the light of the amendments and remarks presented herein.

Respectfully submitted,
DANN, DORFMAN, HERRELL AND SKILLMAN
A Professional Corporation
Attorneys for Applicant

By Vincent T. Pace
VINCENT T. PACE
PTO Registration No. 31,049

Tel.: 215-563-4100
Fax: 215-563-4044
e-mail: vpace@ddhs.com